LISTING OF THE CLAIMS

1. (Original) An optical system, comprising:

a dispersing element operable to disperse a light beam at a wavelength-dependent angle; and

a variable index electro-optic device positioned in the path of said light beam, said variable index electro-optic device comprising a variable index electro-optic element having an electrically-variable refractive index, such that said variable index electro-optic element is operable to perform wavelength-selective filtering of said light beam, dependent on the value of an applied control voltage.

2. (Original) The optical system of claim 1 wherein said variable index electro-optic element is operable to perform said wavelength-selective filtering function selected from the group consisting of short wavelength pass filtering, long wavelength pass filtering, and bandpass wavelength filtering.

3. (Original) The optical system of claim 1 wherein said variable index electro-optic element is operable to perform said wavelength selective filtering by varying the critical angle for total internal optical reflection (TIR) at an interface of said electro-optic element in response to said applied control voltage.

4. (Original) The optical system of claim 3 wherein said variable index electro-optic device comprises a first said electro-optic element and a second said electro-optic element, through which said light beam propagates sequentially;

said first electro-optic element operable tunably to partially segregate light of undesired wavelengths shorter than a desired wavelength from said light of said desired wavelength at a TIR interface, dependent on the value of a first applied control voltage; and

said second electro-optic element operable tunably to partially segregate light of undesired wavelengths longer than said desired wavelength from said light of said desired wavelength at a TIR interface, dependent on the value of a second applied control voltage.

5. (Original) The optical system of claim 1 wherein said variable index electro-optic device comprises an electro-optic material.

6. (Original) The optical system of claim 5 wherein said variable index electro-optic device comprises a liquid crystal material.

7. (Original) The optical system of claim 6 wherein said variable index electro-optic element comprises a layered structure, wherein a layer of liquid crystal material is disposed between layers of dielectric material.

8. (Original) The optical system of claim 1 wherein:

said system constitutes part of an external cavity laser (ECL) operable to generate a light beam at a single tunable wavelength dependent on said applied control voltage; and

said ECL additionally comprises:

an optical feedback element; and

an optical gain medium operable to generate said light beam at a wavelength within a range of wavelengths by stimulated emission and disposed to direct said light beam toward said dispersing element and said optical feedback element.

9. (Original) The optical system of claim 8 wherein said ECL is operable to tune said tunable wavelength by changing the effective optical path length in said variable index electro-optic element, dependent on said value of said applied control voltage, such that the mode number of said light beam generated in said ECL is electrically tuned.

10. (Original) The optical system of claim 9 wherein said variable index electro-optic element is disposed between said gain medium and said dispersing element.

11. (Original) The optical system of claim 8 wherein said ECL is operable to generate a light beam at said single tunable wavelength by varying the critical angle for total internal optical reflection (TIR) at an interface of said variable index electro-optic element in response to said value of said applied control voltage.

12. (Original) The optical system of claim 8 wherein said optical feedback element comprises a retro-reflector and wherein said variable index electro-optic element is disposed within said ECL between said dispersing element and said retro-reflector.

13. (Original) The optical system of claim 8 wherein said variable index electro-optic device comprises a first said electro-optic element and a second said electro-optic element through which said light beam propagates sequentially;

said first electro-optic element operable to perform said wavelength selective filtering by varying the critical angle for TIR in response to a first applied control voltage; and

said second electro-optic element operable to perform said selective tuning of the mode number of said generated light beam by changing the effective optical path length in said second electro-optic element in response to a second applied control voltage.

14. (Original) The optical system of claim 8 wherein said ECL further comprises a collimating element disposed between said optical gain medium and said dispersing element.

15. (Original) The optical system of claim 14 wherein said ECL further comprises an optical relay element disposed between said optical gain medium and said collimating element.

16. (Original) A method of tunable wavelength filtering without mechanical motion, said method comprising:

receiving a light beam of wavelength within a range of wavelengths;

dispersing said light beam at a wavelength-dependent angle;

propagating said light beam through an electro-optic device comprising an electrically-variable refractive index electro-optic element; and

applying a control voltage to said electro-optic device to cause tunable wavelength filtering dependent on said control voltage.

17. (Original) The method of claim 16 wherein applying said control voltage causes tunable wavelength filtering selected from the group consisting of short wavelength pass filtering, long wavelength pass filtering, and bandpass wavelength filtering.

18. (Original) The method of claim 16 further comprising:

varying the critical angle for total internal reflection (TIR) at an interface of said variable index electro-optic element in response to applying said control voltage;

totally internally reflecting light of desired wavelength in said light beam at said interface in response to varying said critical angle; and

partially segregating light of undesired wavelengths in said light beam from said light of said desired wavelength at said interface in response to varying said critical angle.

19. (Original) The method of claim 18 wherein said electro-optic device comprises a first variable index electro-optic element and a second variable index electro-optic element, and said tunable wavelength filtering comprises:

applying a first control voltage to said first variable index electro-optic element;

applying a second control voltage to said second variable index electro-optic element;

propagating said light beam sequentially through said first variable index electro-optic element and said second variable index electro-optic element;

tunably partially segregating light of undesired wavelengths shorter than said desired wavelength at a TIR interface of said first variable index electro-optic element in response to applying said first control voltage; and

tunably partially segregating light of undesired wavelengths longer than said desired wavelength at a TIR interface of said second variable index electro-optic element in response to applying said second control voltage.

20. (Original) The method of claim 19 wherein said first control voltages and said second control voltage have values independent of one another.

21. (Original) The method of claim 16 wherein said tunable wavelength filtering, said receiving, said dispersing, and said propagating occur within an external cavity laser (ECL), said ECL comprising an optical gain medium, a dispersing element, an optical feedback element, and a variable index electro-optic element.

22. (Original) The method of claim 21 wherein said optical feedback element comprises a retro-reflector and wherein said light beam is retro-reflected within said ECL through said variable index electro-optic element and said dispersing element to said gain medium.

23. (Original) The method of claim 21 further comprising:

varying the effective optical path length through said variable index electro-optic element in response to a variable control voltage applied to said variable index electro-optic element; and

causing said light beam to oscillate within said ECL at a desired tunable wavelength in response to said varying optical path length, such that the mode number of said oscillating light beam within said ECL is electrically tuned.

24. (Original) The method of claim 21 further comprising:

varying the critical angle for TIR at an interface of said variable index electro-optic element in response to applying said control voltage;

totally internally reflecting light of desired wavelength in said light beam at said interface in response to varying said critical angle;

partially segregating light of undesired wavelengths in said light beam from said light of said desired wavelength at said interface in response to varying said critical angle; and

causing said light beam within said ECL to oscillate at a desired tunable wavelength in response to said tunable wavelength filtering of said light beam.

25. (Original) The method of claim 16 wherein said variable index electro-optic element comprises a layer of liquid crystal material disposed between layers of dielectric material.

26. (Original) The method of claim 16 wherein said control voltage has a value determined in response to a feedback control signal.

27. (Original) The method of claim 16 wherein said receiving said light beam comprises:

emitting said light beam; and

collimating said emitted light beam prior to said dispersing.

28. (Original) The method of claim 27 further comprising transforming the beam divergence of said emitted light beam from a low divergence value to a higher divergence value prior to said collimating.